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SNOW SURVEYS AND IRRIGATION WATER FORECASTS

for the

RIO GRANDE DRAINAGE BASIN

May 1, 1944

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U. S. DEPARTMENT OF AGRICULTURE

Issued by the
United States Department of Agriculture
Soil Conservation Service
Division of Irrigation
In Cooperation with
The Colorado Agricultural Experiment Station
Colorado State College
Fort Collins, Colorado

May 10, 1944

SNOW SURVEYS AND IRRIGATION WATER RECORDS

FOR THE

THE GRAND DRAINAGE BASIN

MAY 1, 1944



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Colorado State College
Fort Collins, Colorado

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SNOW SURVEYS AND IRRIGATION WATER FORECASTS

For

RIO GRANDE BASIN

May 1, 1944

The following data pertaining to snow surveys and irrigation water-supply forecasts are provided by the Division of Irrigation, Soil Conservation Service of the U. S. Department of Agriculture, in cooperation with other Federal Bureaus, State Departments, and local organizations. The snow measurements are made principally by field personnel of the U. S. Forest Service, U. S. Indian Service and Colorado State Engineer. This work is otherwise conducted cooperatively with the State Engineers of Colorado and New Mexico, Colorado Agricultural Experiment Station, and various municipalities, irrigation associations and others. Precipitation records are supplied by the U. S. Weather Bureau.

PRECIPITATION DATA

(Based on incomplete returns)

WATERSHED	STATE	Precipitation October 1 to April 30	Departure from Normal	Precipitation	Departure from Normal
		Inches	Inches	April Inches	Inches
Canadian	New Mexico	5.97	-0.60	2.34	+0.97
Rio Grande	Colorado	15.57	+3.85	4.49	+2.74
Rio Grande (N)	New Mexico	7.51	-0.26	1.73	+0.49
Rio Grande (S)	New Mexico	3.45	-0.97	0.25	-0.34
Pecos	New Mexico	4.87	-0.52	0.52	-0.42

Precipitation was above normal during April over the watershed of the Canadian River in New Mexico and the Rio Grande in Colorado and northern New Mexico. It was below normal over the watershed of the Pecos and Rio Grande in southern New Mexico. The accumulated precipitation from October 1 to April 30 is deficient in all areas except on the upper Rio Grande in southern Colorado where there was an excess of 3.85 inches.

SUMMARY OF MAY 1 SNOW SURVEYS AND COMPARISON OF DATA WITH THAT OF PREVIOUS YEARS BY WATERSHEDS

WATERSHEDS	Snow Depth			Water Content			Number Courses in			Snow Density			1943 Water Content in percent of	
	Eight year Avg.*	1943	1944	Eight year Avg.*	1943	1944	Average			Eight year Avg.*	1943	1944	Eight year Avg.*	1943
	In.	In.	In.	In.	In.	In.				Percent	Percent	Percent	Percent	
Rio Grande	28.5	11.3	46.1	11.4	4.9	16.5	9			40	43	36	145	337
Canadian River	--	--	--	--	--	--	--			--	--	--	--	--

*Some for shorter periods

WATER SUPPLY OUTLOOK

RIO GRANDE. The May 1 snow surveys, made principally in the San Luis Valley area of this drainage, show the average water content of the snow to be 16.5 inches as compared with 4.9 inches on the same courses a year ago. During April there was a small increase in the water content of the snow. At Wolf Creek Pass the water content is now nearly 41 inches, Summitville 30.5 and on Cimbras Pass 26. Last year at this time all the snow courses were bare except those at extreme elevation, while now all courses observed had fair to excellent snow depth. Since the first of this month melting has occurred on the lower slopes and foothills, but because of the cold cloudy weather no runoff is coming from the high mountain country. It will probably not start until about the 15th or 20th of this month for the San Luis Valley area. In northern New Mexico the snow melt will start earlier. On the Carson National Forest at Taos Canon, Red River and Hematite Park, the snow depth averages about 25 inches, containing nearly 10½ inches of water. The runoff in these tributary streams is expected to add materially to the total flow of the Rio Grande.

The reservoir storage in the Rio Grande drainage is much less than it was a year ago. In the San Luis Valley area the amount now in the principal reservoirs is 57,000 acre-feet or only 60 percent of that of last year at this time. It is expected that the coming runoff will be very material and will increase the storage to a total of about 140,000 acre-feet. The El Vado Reservoir will probably reach a total of 125,000 acre-feet and there will be available sufficient water to fill Elephant Butte and Caballo to full capacity. Because of the late planting season required farming operations will hold off direct irrigation, thus permitting water to be available for storage until about June 15 in the San Luis Valley.

The present outlook for the coming season's irrigation water supply is exceptionally good. Should there be a marked rise in temperature, continuing for a few days, the runoff will be excessive and will possibly reach a maximum stage approaching the crest of 1941. The stream flow generally, in both Colorado and northern New Mexico, is low due to cold weather. Soil moisture conditions throughout the irrigated districts are good.

CANADIAN AND PECOS RIVERS. The runoff in these streams will be more than last year. The water content of the snow on the headwaters of the Canadian now approximates about 10 inches in comparison with an estimated 2 inches last year at this time. A substantial amount of water will be available for additional storage in Conchas Reservoir the coming few weeks. Over the Bureau of Reclamation Project area the soil moisture is good, stream flow normal and the crop prospects now good for a successful year.

The outlook for the Pecos is fairly good from the standpoint of runoff from snow cover. The present water content of the snow over the headwaters of this stream is about normal, and it is estimated that the April-July runoff at the Almagordo Reservoir will be 120,000 acre-feet. Reservoir storage on the Carlstad Project is now one-third of that of a year ago and the total filling this season is not expected to exceed 100,000 acre-feet. On this project the soil moisture is low, stream flow below normal and present crop conditions only fair.

GROUND WATER. Recent measurements indicate that the ground-water level is rising in the Middle Rio Grande Conservancy District. This is attributed to the floods of 1941 and 1942. Water levels are low in southwestern New Mexico and are above normal in the Pecos Valley.

RIO GRANDE WATERSHED
Summary of Federal and State Cooperative Snow Surveys
Issued May 10, 1944, at Fort Collins, Colorado.

No.	Main Drainage and Snow Course	Local Drainage	State	Location		Elev.	National Forest	May 1 Snow Cover Measurements					
				Locality	Description			Av. Snow Depth	Av. Water Content	Av. Snow Depth	Av. Water Content	Av. Snow Depth	Av. Water Content
								1943	1944	1943	1944	1943	1944
								In.	In.	In.	In.	In.	In.
26	Wolf Creek Pass	South Fork Rio Grande	Colo.	Wolf Cr. Pass	4-37N-2E	10000	Rio Grande	62.2	30.6	101.4	27.5	14.9	In.
27	Upper Rio Grande	Rio Grande	"	Rio Grande Res.	13-40N-4W	9350	"	4.4	0.0	37.5	1.6	0.0	40.5
47	Silver Lakes	Alamosa R.	"	1mi. S. Silver L.	15-36N-5E	9600	"	4.0	0.0	12.0	1.3	0.0	14.2
49	River Springs	Conejos R.	"	10mi. W. Mobote	25-33N-6E	9300	"	11.6	0.0	35.3	4.2	0.0	3.9
74	LaVeta Pass #2	SanCristoCr.	"	LaVeta Pass	22-28S-70W	9300	SanCristoCr	68.0	39.8	93.6	24.0	14.8	30.5
76	Summitville	Wightman Cr.	"	Summitville	30-37N-4E	11500	Rio Grande	44.1	31.7	65.4	20.9	14.7	25.8
77	Cumbres Pass #2	Los Pinos R.	"	Cumbres Pass	17-32N-5E	10000	"	6.0	0.0	19.7	2.3	0.0	6.4
80	Santa Maria	N. Clear Cr.	"	Santa Maria Res.	8-41N-2W	9700	"	33.1	0.0	45.3	11.8	0.0	13.9
82	Culebra	Culebra R.	"	12mi. E. San Luis	37-2N-05.2W	10000	SanCristoGr	7.8	0.0	4.6	2.2	--	1.2
84	Fort Garland	Big Ute Cr.	"	6mi. N. Ft. Garland	13-29N-72W	8200	"	22.8	0.0	32.1	9.2	0.0	12.8
1	Red River	Red River	N. Mex.	6mi. SE. Red River	29-28N-15E	9500	Carson	--	--	18.8	--	--	7.9
2	Taos Canyon	Rio de Taos	"	14mi. E. Taos	10-25N-15E	9000	"						
4	Aspen Grove	Rio En Medio	"	10mi. NE. Santa Fe	12-18N-10E	9100	Santa Fe						
5	Lee Ranch	Jemez Cr.	"	5mi. NW. Bland	3-18N-4E	9050	"						
6	Canjilon	Canjilon Cr.	"	8mi. NE. Canjilon	4-26N-6E	9500	Carson	0.0				0.0	
7	Rio Nutrias	Rio Nutrias	"	10mi. SE. Park View	6-27N-5E	7900	"						
8	Panchuela	Panchuela Cr.	"	1mi. N. Cowles	34-19N-12E	8500	Santa Fe						
9	Hematite Park*	Red River	"	3mi. SE. Red R.	8-28N-15E	9500	Carson						
12	Tres Ritos	Agua Piedra	"	7mi. W. Holman	23-22N-13E	9000	"						
15	Pay Role	Rock Creek	"	4mi. SE. Hopewell	16-28N-7E	10000	"						
16	Jicarilla	Rock Lake Cr.	"	15mi. S. Dulce	9-29N-1W	8500	Jicarilla R.						
17	Chama Divide	Willow Creek	"	6mi. W. Chama	36.9N-106.7W	7750	Off Forest						
18	Chamita	Chamita Cr.	"	6mi. NW. Chama	36.9N-106.7W	8500	"	28.5	11.3	46.1	11.4	4.9	16.5
					Average for Drainage								
9	Hematite Park	Moreno Creek	N. Mex.	3mi. SE. Red R.	8-28N-15E	9500	Carson						
10	Ocate Mesa	Ocate Creek	"	3mi. E. Blake L.	25-24N-16E	9200	Off Forest						
					Average for Drainage								

*On adjacent drainage.

@Average for period of record

RESERVOIR STORAGE

Reservoir Storage in Thousands of Acre-Feet, Rio Grande Drainage, as of May 1, for the Years 1935-1944, inclusive. (Based on data from the State Engineer of Colorado, U. S. Bureau of Reclamation and other agencies).

A = Percentage of capacity.

B = Percentage of 10-year average. C = Percentage of filling forecast for 1944.

Reservoir	Capacity Ac-ft.	1935 Ac-ft.	1936 Ac-ft.	1937 Ac-ft.	1938 Ac-ft.	1939 Ac-ft.	1940 Ac-ft.	1941 Ac-ft.	1942 Ac-ft.	1943 Ac-ft.	1944 Ac-ft.	10-yr. Avg. \bar{p} Ac-ft.	A %	B %	C %
RIO GRANDE DRAINAGE															
Rio Grande	45.8	0.3	23.6	16.2	17.5	36.7	4.7	8.4	49.1	7.8	13.1	17.7	29	74	85
Santa Maria	45.0	4.6	6.9	9.5	10.8	15.1	3.8	4.6	26.9	15.4	6.3	10.4	14	61	65
Sanchez	103.2	7.4	13.8	17.6	19.2	22.9	10.9	8.6	37.9	35.0	16.6	19.0	16	87	40
Terrace	17.7	1.3	6.4	4.5	9.6	7.5	1.7	3.8	9.1	1.3	5.1	5.0	29	102	70
Continental	26.7	0.8	3.3	0.5	4.0	4.3	1.0	0.0	10.0	16.2	8.2	4.8	31	171	55
Elephant															
Butte	2273.7	488.0*	782.5	917.1	1099.0	1324.0	803.2	598.5	2126.0	1653.1	1140.4	1093.2	50	104	100
Caballo	365.0	--	--	0.0	14.5	44.5	17.3	67.8	263.1	238.3	196.2	105.2	54	186	100
El Vado	226.0	--	--	--	148.6	87.4	113.7	129.3	155.5	127.0	72.3	119.3	32	61	55
CANADIAN DRAINAGE															
Conchas	600.0	--	--	--	--	--	80.6	155.5	390.6	390.3	397.0	282.8	66	140	65
PECOS DRAINAGE															
Alamogordo	148.0	--	--	--	11.2	95.6	50.2	41.4	129.8	89.4	25.5	63.2	17	40	--
McMillan	32.3	2.8	11.0	13.3	6.7	14.7	9.8	35.9	30.8	20.3	11.0	15.6	34	71	--
Avalon	7.0	1.8	3.4	1.9	1.8	3.0	0.8	4.7	5.1	0.8	1.1	2.4	16	46	--

\bar{p} Some averages for shorter periods.

*Based on capacity of 2,407,100 acre-feet

1890

1900

1900

1940

1. The first part of the document is a list of names and their corresponding addresses. The names are listed in the first column, and the addresses are listed in the second column. The names are: John Doe, Jane Smith, and Bob Johnson. The addresses are: 123 Main St, 456 Elm St, and 789 Oak St.

1900

1870

1917

1871

100